

Nomination of the Upper Sevier River Watershed for the U.S. EPA's Targeted Watershed Grant

Including the Upper Sevier River (16030001) and East Fork Sevier River (16030002) Watersheds.

303(d) listed waterbodies in the project area include the East Fork Sevier River from its confluence with the Sevier River upstream to Otter Creek Reservoir, Otter Creek Reservoir, and the Upper Sevier River from Circleville to the confluence with Mammoth Creek.

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Abstract

This proposal for the EPA Targeted Watershed Grant is comprised of 3 main objectives to address sources of impairment in the Upper Sevier River watershed. These include two areas of focus for stream restoration activities that share the goals identified in the TMDL and Watershed Plan to reduce sediment and phosphorus loading to the river and correct historic habitat alteration. The third objective of this project is intended to mitigate the effects of inefficient irrigation practices and the contribution of nutrients and sediments to the river from irrigation runoff. The expected outcome of these projects is the establishment of a Blue Ribbon Fishery and the reduction of nonpoint source pollution from private lands. The project will also provide landowners with tools and training for the conservation of water resources and maintenance of a sustainable fishery through proper grazing management.

Introduction

The Upper Sevier River Watershed encompasses approximately 1.3 million acres, covering the headwaters of the Sevier River in Beaver, Garfield, Iron, Kane, Wayne and Piute Counties of south-central Utah. Land ownership in the watershed is predominantly public lands (~85 %) and private land is concentrated mainly in the lower elevation valleys where traditional uses of hayland and grazing occur. No major urban centers exist in the watershed and primary pollutant sources include nonpoint sources from agriculture, recreation and septic systems in areas of summer home development. Impairments to the river include excess sediment, high total phosphorus, and habitat alteration, primarily as a result of intensive grazing and irrigation runoff. In addition, high stream temperatures may limit the potential for developing a coldwater fishery in some reaches due to a lack of riparian vegetation and stream shading.

The Upper Sevier River Community Watershed Project has recently completed their watershed planning process and is currently implementing restoration projects in priority areas (the watershed plan is available online at <http://www.fs.fed.us/r4/dixie/projects/uswmp/index.html>). Concurrent with this planning process, the Division of Water Quality developed TMDLs for 4 river segments and two lakes in the watershed. In addition, the Division is currently developing TMDLs for Otter Creek Reservoir and the East Fork Sevier River, which provides greater than 80% of the flow and a corresponding phosphorus load to the reservoir via a diversion near Antimony, UT. In cooperation with numerous agencies and landowners, the Division of Water Quality performed the NRCS Stream Visual Assessment Protocol on more than 75 stream miles in the study area, assessed sources of pollution and habitat alteration, and prioritized reaches for restoration activities. Results of this survey (included in the TMDL) indicate that a majority of the streams in the watershed are in poor condition due to severe bank erosion, lack of riparian vegetation, excessive sedimentation and

nutrients, and the absence of adequate fish and macroinvertebrate habitat. Despite the severe habitat alteration which has occurred in the watershed, the Utah Division of Wildlife Resources (DWR) has identified segments of the Upper Sevier River as focus areas under their Blue Ribbon Fisheries program and has enhanced a number of reaches to improve fish habitat. Habitat restoration is also designed to benefit the leatherside chub (a sensitive species in Utah). This project is intended to address the major causes of impairment identified in the TMDL which include nonpoint sources of sediment and nutrients from bank erosion, grazing, and irrigation practices.

In an effort to address sources of impairment in the river, the Upper Sevier River Steering Committee has sponsored the Upper Sevier River Community Watershed Project (funded by the USDA Forest Service's Community-Based Watershed Restoration Partnerships) which promoted the local watershed planning process and funded watershed restoration on the Dixie National Forest. Although the watershed is predominately public lands, the majority of water quality and aquatic habitat issues occur on private lands in the valleys. The Community Watershed Project has been successful in attaining funding from the 319 program and EQIP to address nonpoint source issues, but these funds are limited with respect to the amount of restoration work necessary to meet the endpoints of the TMDL. Therefore, the need for adequate funding to address these problems on private lands is imperative to the success of the Community Watershed Project and the restoration of the Upper Sevier River.

Description of the Proposed Projects

This project is comprised of 3 main objectives to address sources of impairment in the Upper Sevier River watershed. These include two areas of focus for stream restoration activities that share the goals identified in the TMDL and Watershed Plan to reduce sediment and

phosphorus loading to the river and correct historic habitat alteration. They are presented as separate objectives since the restoration activities differ in their approach and their potential to provide fishery habitat. The third objective of this project is intended to mitigate the effects of inefficient irrigation practices in the Panguitch Valley and the contribution of nutrients and sediments to the river from irrigation runoff.

Objective 1. Improve stream channel condition, riparian vegetation and fish habitat, and reduce sediment and phosphorus loads to the river. The Division of Wildlife Resources has identified several priority areas on the Upper Sevier and East Fork Sevier River where stream restoration is most likely to provide tangible benefits to the fishery (see Map). This work will occur in three main area of the watershed with the greatest potential for enhancing habitat for trout and leatherside chub. The DWR has already implemented a number of restoration projects on approximately 6 miles of stream in these priority areas (with an additional 2.5 miles in 2005) and these proposed activities are intended to compliment these projects. In addition to providing habitat for trout , stabilizing stream banks, establishing woody riparian vegetation, adding logs, rock and structure to the stream, and building shallow backwater areas will create significantly better habitat for leatherside chub. With stable banks, increased cover and stream complexity, trout and leatherside chub populations are expected to increase. In addition, it is expected that the combined effect of stream restoration projects in this area will result in load reductions of phosphorus and sediments to the Upper Sevier River.

Area 1: Located near Hatch, Utah on the main stem of the Upper Sevier River, this reach encompasses approximately 2.3 miles of river. An additional 1.5 miles of stream restoration immediately downstream is currently being implemented utilizing 319 nonpoint source funding. Heavy equipment (excavators, front-end loader and dump truck) will be used to reshape stream banks and channel, build floodplains and install in-stream structures. To stabilize stream banks and

help establish woody riparian vegetation, a combination of techniques will be used including the installation of large rock and log j-hook vanes, juniper tree revetments, erosion control fabric, bank sloping, and restoring proper stream channel dimensions, pattern and profile. Additional fish habitat and in-stream structure will be created using root wads and logs. All disturbed areas will be reseeded and willow cuttings and bare root trees and shrubs planted. Volunteers from the DWR Dedicated Hunter Program will be used to plant willows and bare root stock. The river corridor and project area will be fenced to allow proper management of livestock grazing. Grazing management will require 3-5 years of rest to allow riparian vegetation (willows, cottonwoods, water birch and others) to become well established. Following that, grazing will be managed to protect riparian vegetation from being degraded. A grazing management plan will be outlined in written agreements with landowners.

Area 1 is expected to cost \$182,875 (TWG funds: \$ 150,875, Matching Funds: \$32,000)

Area 2: Located on the East Fork Sevier River near Kingston, UT, this project complements several projects already implemented by the DWR and NRCS which encompass approximately 1.5 miles of stream below Otter Creek Reservoir. The proposed project will entail less intensive suite of practices than Area 1 and is expected to cost less per mile of restoration. Restoration will include the use of heavy machinery for bank sloping, and installing rock barbs and vanes along 4 miles of stream. Juniper revetments will be installed and bare banks re-vegetated with grasses, willows, cottonwoods, and other woody vegetation. Grazing management and fencing will be included to allow for development of vegetation and to maintain the health of riparian areas. This project will be coordinated by the Upper Sevier River Watershed Coordinator in conjunction with the DWR, NRCS and the local landowners. It is estimated that 2 miles of stream will be completed each year

for 2 years after receiving the grant. Matching funds will be provided primarily by the local landowners.

Area 2 is expected to cost \$180,000 (TWG funds: \$ 146,000, Matching Funds: \$34,000)

Area 3: The East Fork Sevier River in Black Canyon (south of Antimony, Utah) is the site of a number of fishery restoration projects funded by the DWR on both private and BLM lands.

Overall, the DWR has restored approximately 3.5 miles in this area. This project proposes to re-establish floodplains, install fish habitat structures, and plant woody vegetation along 2.5 miles of stream utilizing the techniques described for Area 1. Of this, approximately one mile of stream is located on BLM land with the DWR and the BLM providing a 50/50 cost share (the BLM share of the funding is not, however, included in the estimation of the projects to be funded by this grant).

In addition, another 1.9 miles of stream on private land will be treated by sloping of high, eroding banks, installation of rock vanes and revetments and planting of woody vegetation. As with all the proposed projects, grazing management plans will be implemented to ensure their success and future maintenance. Matching funds will be provided by the DWR, volunteers and private landowners. Completion is anticipated within the first two years of the project period.

Area 3 is expected to cost \$222,050 (TWG funds: \$ 139,050, Matching Funds: \$83,000)

Total Cost for Objective 1 is \$584,925 (TWG funds: \$435,925, Matching Funds: \$149,000)

Objective 2. Stabilize severely eroding stream banks, and re-establish riparian vegetation to reduce sediment and phosphorus loads to the Upper Sevier River. This objective is intended as a phased approach to restoring the biological integrity of the watershed by addressing the main cause of impairment and assessing the improvement and potential for a viable fishery. This project will be implemented primarily in the Panguitch Valley where the greatest feasibility exists for stabilizing

banks, establishing woody vegetation, and managing the intensive grazing practices which currently preclude its establishment (**Area 4** on map). This area was identified as a major contributor of phosphorus and sediment to the river, and is likely to respond well to stabilization and grazing management. Panguitch Valley is not a priority area for the DWR for the immediate establishment of fishery habitat. However, if this project is successful in narrowing the stream channel, reducing sedimentation, moderating temperatures through stream shading and reducing nutrient loading, it is likely in the future that DWR will implement in-stream fishery habitat projects like those in other areas of the watershed. Bank sloping, juniper revetments, seeding and willow planting will be implemented on approximately 15 miles of stream and will include the development of grazing management plans and fencing of the corridor to exclude cattle. Agreements with landowners will be secured to rest the riparian corridor from grazing until streambanks are stabilized and vegetation is established. Since most of the work will be performed by landowners and volunteers who will install fencing and revetments and plant willow cuttings, the match requirements will be met primarily through in-kind contributions. Grant funds will pay primarily for fencing materials and heavy equipment rental. The projects will be designed and managed by the Watershed Coordinator in consultation with DWR and NRCS staff. It is anticipated that approximately 5 miles/year of stream will be treated for the next 3 years.

Total cost for Objective 2 is \$237,000 (TWG: \$105,000, Non-federal Match: \$132,000)

Objective 3. Increase water use efficiency and reduce runoff to the Sevier River through irrigation efficiency studies, on-farm soil moisture monitoring and generation of real-time evapotranspiration. This two year program will target irrigators in the Panguitch and Hatch Valleys of the Upper Sevier River to help them improve irrigation efficiency and reduce pollution associated with excessive irrigation run off and inefficient irrigation systems. Irrigators would be given information regarding

evapotranspiration and taught scheduling of irrigation from crop water use. Water quality will be monitored for total phosphorus and total suspended solid during research activities.

Task 1: Conduct Irrigation Efficiency Studies. Traditionally, flood irrigation has been the most prevalent irrigation system in the Upper Sevier River Watershed. In the last 3 years, farmers have converted over 750 acres to sprinkler irrigation, but they lack understanding of irrigation techniques with these systems which only reach peak efficiency when managed properly. During this two year project, graduate students from Utah State University's Irrigation Engineering program will conduct a minimum of 2 irrigation efficiency studies on each of the three most common irrigation systems: flood, wheel move sprinklers, and pivots. Students will measure application efficiency and associated runoff and water quality sampling will determine the contribution of total phosphorous and sediment to the river and monitor effectiveness of projects in reducing these loads.

Task 2: On Farm Soil Moisture Monitoring. Twenty farmers will be provided with a Watermark meter and 6 soil moisture sensors. An irrigation workshop would be held to demonstrate the use of the soil moisture monitoring equipment, record keeping and interpreting the data. Installation of the equipment will be done by the Extension Agent, the watershed coordinator and/or the farmer. Cooperating farmers and a technician will keep records of irrigation management and moisture sensor readings. Records will be analyzed and fact sheets published to help other farmers improve irrigation scheduling. Each year, twenty new farmers would be allowed to utilize the equipment. At the end of 2 years 40 farmers would have improved irrigation practices.

Task 3: Generation of Real-time Crop Water Use (Evapotranspiration). Grant funding will be used to purchase an electronic weather station and 5 evapotranspiration gages stationed at the Utah State University Experiment Farm and four other locations around the Panguitch Valley. The weather station data would be downloaded via cell phone, published to a website and available at the NRCS office, USU Extension Office and the Upper Sevier Watershed coordinators office. A part-

time technician will monitor the ET gages and the coordinator and technician will compile data and analyze data across all sites.

Total cost for Objective 3 is \$76,000 (TWG: \$46,000, Non-federal Match: \$30,000)

Monitoring: Water quality, biological, and physical habitat monitoring to assess the effectiveness of stream restoration projects will be performed by the DWQ. The DWR will monitor changes in fish populations under their current surveying program. Since these are activities funded by Federal programs at the state level, they are not included in the budget calculations. The DWQ will establish at least four locations (one in each project “Area”) to collect, chemical, physical and biological data using the Environmental Monitoring and Assessment Program (EMAP) protocol. DWQ has been establishing EMAP sites statewide as part of the EPA program and to develop reference sites for comparison and trend analysis. Data collection will be coordinated with this program so that project reaches can be compared against reference sites. In addition, DWQ has several long-term water quality stations (see Map) for comparison of historic conditions to future improvements. All chemical and biological data will be stored in the EPA STORET database. The irrigation efficiency projects will be assessed as part of the study design and the resulting data will be provided to DWQ to incorporate in the STORET database. Project monitoring will be accomplished by the DWQ project manager through individual contracts with participating agencies and will include detailed requirements for tracking progress and documenting results.

Project Management

The Division of Water Quality will be the primary grantee and will develop contracts with the USU Extension, the Division of Wildlife Resources and the Upper Sevier Soil Conservation District (employer of the local Watershed Coordinator). The project management on the local level will be

performed by the individuals listed in Appendix A. The local coordinator will be involved in the majority of the projects listed here and the project management funds, as identified in the budget, will be funding the coordinator on a part-time basis for the 3 years of the project. Match will be provided by the Division of Water Quality.

Total cost for Project Management is \$92,000 (TWG: \$69,000, Non-federal Match: \$23,000)

Outreach

The main element of outreach on a local level for this project will be the demonstration of stream restoration activities to local landowners through a series of tours and workshops located in each of the priority areas identified in the plan. The project managers will coordinate 2 tours in each area for a total of 6 tours each year. Several workshops will be held to instruct landowners on how to construct revetments, plant woody vegetation, and other streambank stabilization techniques in addition to the development of grazing management plans for riparian areas. In addition the project managers will present aspects of the project and the resulting environmental benefits at the Utah Nonpoint Source Conference each year and make every effort to present findings at related conferences either regionally or nationally. In the first year of the irrigation study, the project manager will plan an education workshop for farmers who are interested in improving irrigation management. The soil moisture monitoring, irrigation studies and evapotranspiration will be included in the introductory training. At the end of the study a workshop will be conducted and fact sheets describing the results will be published and distributed to farmers and irrigation companies. The project manager or watershed coordinator will attend 2-3 state, regional or national meetings and present the results.

Total cost for Outreach is \$ 38,667 (TWG: \$29,000, Non-federal Match: \$9,667)

Table 1. BUDGET INFORMATION - EPA Watershed Initiative Grant Program¹

SECTION A - BUDGET SUMMARY						
Watershed Project, Activity or Work Plan Element			Federal		Non-Federal	Total
1. Stream Channel/Fishery Habitat Improvement			\$435,925		\$149,000	\$584,925
2. Streambank Stabilization			\$105,000		\$132,000	\$237,000
3. Irrigation Efficiency Project			\$46,000		\$30,000	\$76,000
4. Outreach ^a			\$29,000		\$9,667	\$38,667
5. Project Management			\$69,000		\$23,000	\$92,000
Totals			\$684,925		\$343,667	\$1,028,592
SECTION B - BUDGET CATEGORIES						
	Watershed Project, Activity or Work Plan Element					Total
Budget Categories	(1)	(2)	(3)	(4)	(5)	
a. Personnel						
b. Fringe Benefits						
c. Travel						
d. Equipment						
e. Supplies						
f. Contractual	\$435,925	\$105,000	\$46,000	\$29,000	\$69,000	\$684,925
g. Construction						
h. Other						
i. Total Direct Charges (line a-h)	\$435,925	\$105,000	\$46,000	\$29,000	\$69,000	\$684,925
j. Indirect Charges						
TOTALS (line i-j)	\$435,925	\$105,000	\$46,000	\$29,000	\$69,000	\$684,925

^aTravel and expenses for the annual conference will be included in the contract with the local Watershed Coordinator and included in Outreach.

¹ Excerpted from Standard Form 424A, OMB Circular A-102

Appendix A. Experience of Project Managers

James Harris has been an Environmental Scientist for the Division of Water Quality for the past 5 years during which his primary responsibility has been the development of TMDLs in the Sevier River Watershed. He has extensive experience in contract management on a number of projects including TMDL studies, 319 projects, and the oversight of local watershed coordinators. He will be responsible for project management, tracking, analysis of environmental data and dissemination of project results. The DWQ will be the primary grantee and will administer contractual funds to the project leaders listed below.

Stanley G. Beckstrom, Aquatic Biologist with the Utah Division of Wildlife Resources, has five years experience in planning and implementing terrestrial and aquatic habitat enhancement projects and impact analysis, which included working with Stream Channel Alteration permitting, and management of regional GIS data. For the last 2 ½ years, he has worked as the Blue Ribbon Fisheries Biologist with primary responsibility to secure public access to quality fisheries and conduct aquatic habitat improvement projects. Since year 2000, he has assisted with or been primary supervisor on at least 13 completed stream restoration and improvement projects.

Wally Dodds, is the Watershed Coordinator for the Upper Sevier Soil Conservation District responsible for the development Upper Sevier River Watershed Plan and the management of 319 project implementation plans. A local rancher, he has coordinated watershed activities for the last 1 ½ years and has been integral in identifying potential projects and fostering public participation in planning and restoration activities. He coordinates all meetings and activities of the Upper Sevier River Steering Committee and co-chairs the Utah Watershed Coordination Council, a statewide group of watershed representatives.

Kevin Heaton, has been the Utah State University Extension Agent for the last 8 years and has managed the USU Experimental Farm in Garfield County where he has performed over

40 research trials and demonstration projects and hosted several training workshops. He is the chair of the Watershed Information and Education Committee, producing regular newsletters and coordinating the educational Watershed Days program for elementary and high school students. He recently served as Irrigation Technical Assistant to the Armenian Small Farm Water Management Research Center. He also holds the position of County Director for Garfield County.